SLO COUNTY apcd | Air Pollution Control District San Luis Obispo County

October 23, 2012

Phil Jenkins, Chief
OHMVR Division
California Department of Parks and Recreation
1725 23rd Street, Suite 200
Sacramento, California, 95816

SUBJECT: APCD Review of September 7, 2012 Draft Particulate Matter Reduction Plan

Dear Mr. Jenkins:

This letter provides our comments on the revised Draft Particulate Matter Reduction Plan (DPMRP) submitted by State Parks on the September 7, 2012. It also is intended to inform you that the current process for review, discussion and reaching consensus on the structure and content of the document is not working and needs to change. After eleven months of conference calls, personal calls, emails and meetings, State Parks staff continue to dispute, defer or simply ignore significant comments by APCD staff and our consultant on needed revisions to the DPMRP.

As a result, the document fails to constitute an emission reduction plan because it fails to target emission reductions of any sort. Instead, the DPMRP continues to focus primarily on a complex, very expensive and unwarranted monitoring effort that appears designed to gather data to cloud the results of the District's two previous monitoring studies rather than augment the process for identifying appropriate control strategies. State Parks representatives have, in fact, stated in two separate meetings that the DPMRP does not contain specific details on potential control measures because the proposed monitoring could show that such controls are not needed. This attitude and approach is unacceptable and appears to be the fundamental cause behind the lack of progress to date.

The DPMRP contains many disclaimers, needless caveats and qualifiers, and pages of unnecessary text that complicate the document and make review and discussion very difficult. As a result, we have spent countless hours talking to your staff about technical details related to the proposed monitoring, while virtually no discussion of potential control strategies has occurred. There are no concrete emission reduction measures proposed in the draft Plan, <u>as required by the rule</u>, and the monitoring proposed in the Plan does not describe how the data collected will be used to determine appropriate locations for the permanent monitoring sites or the control measures required in the rule. Thus, the DPMRP is nowhere near the stage of being conceptually approvable by APCD, despite the substantial time and effort we have put into informing your staff of what is needed in the document to move the process forward.

In addition, the DPMRP in its current form is not sufficient to meet the California Coastal Commission's request to submit a comprehensive document that contains enough information to be considered for approval as part of a master permit application. As you will recall, this was the approach recommended by the Commission rather than applying for individual permits for each project contained in the Plan. This approach was thoroughly discussed and agreed to by State Parks, APCD, the Natural Resources Agency, Coastal Commission and Air Resources Board at the June 29, 2012 meeting of these agencies in Sacramento. It was also further discussed in more detail at the August 10, 2012 meeting in San Luis Obispo between State Parks, APCD, Coastal Commission and County planning staff. In that meeting, Commission staff described the need to approach the PMRP as an environmental enhancement plan detailing the type of control measures and monitoring that would be implemented to help restore and enhance different sections of the park.

State Parks has made no attempt to embrace this approach. Thus, it appears highly unlikely you will be able to meet the next two upcoming compliance milestones described in section F.1 of the rule:

c. By November 30, 2012, submit complete applications to the appropriate agencies for all PMRP projects that require regulatory approval.
d. By February 28, 2013, obtain APCO approval for a Temporary CDVAA and Control Site Baseline Monitoring Program and begin baseline monitoring.

Given the lack of progress on the DPMRP despite the substantial amount of time, effort and input we have provided your staff, it would be very difficult to assign any failure to meet either milestone as being due to delays caused by APCD or any other oversight agency.

Time is running short, and a drastic change in State Parks approach to this effort will be needed to meet those milestones. In particular, as we have stated numerous times, the following revisions to the DPMRP are essential before APCD can conceptually approve it:

1. The Plan, at a minimum, must include significantly more detailed descriptions of the type and potential locations of dust reduction strategies that can be evaluated by the oversight agencies responsible for their approval, such as the Coastal Commission. Despite repeated requests by APCD staff, the current DPMRP contains no commitment whatsoever to any dust reduction strategies in or downwind of the riding areas. State Parks asserts that substantial additional monitoring is needed prior to proposing any control measures and their potential location; yet State Parks has already determined, with no such monitoring, that:

   "The first phase of dust control projects would begin in areas that are not currently open to OHV riding and camping opportunities. Future phases of dust control <u>could be implemented on a limited basis</u> in areas that are open to OHV riding and camping." (page 27)

   This statement illustrates the utter lack of commitment in the DPMRP to reduce emissions from the SVRA and flies in the face of the requirements to meet the performance standard in Rule 1001. In addition, the proposed monitoring plan is clearly not designed to help determine where potential control measures should be sited, nor does it provide any indication of how the data collected will be used in that regard. Regardless, sufficient data has been already been collected by both APCD and State Parks to show both the type of control measures that have proven effective in reducing dust emissions and the critical areas where they can and should be implemented now.

State Parks has documented in previous projects performed in the SVRA that re-establishing foredunes destroyed by vehicle activity, planting vegetation, installing wind fencing and artificial roughness elements are all effective in reducing saltation, a primary driving force behind the dust emissions. Comprehensive APCD field studies and ongoing air monitoring analysis shows the Le Grande tract area in the SVRA to be an important dust source area for the high PM levels measured at our CDF site. Thus, the data already exists to design and install proven emission reduction strategies in an identified critical emission source area. This needs to be addressed in the DPMRP.

2. The monitoring portion of the plan continues to show no nexus between the measurements proposed and how the data would be used to locate control strategies or the permanent monitoring sites. Moreover, State Parks staff has voiced significant opposition to a very modest recommendation by our consultant, Dr. Chatten Cowherd, to perform low-cost mobile monitoring designed to quickly identify areas of high emissivity in the SVRA to help better define where more refined monitoring and potential control measures should be sited (see attached recommendations from Dr. Cowherd). In addition, despite many requests by APCD, the plan completely excludes any monitoring in the area we have identified as an important source of PM emissions: the central section of the Le Grande tract. The monitoring plan will not be approved if it does not include monitoring in this area and does not fully define the nexus between the measurements proposed and how the data will be used to locate control strategies and the permanent monitoring sites.

3. Vehicle activity is a known source of PM emissions at the SVRA, yet there is no firm commitment or approach specified for identifying areas of high vehicle activity. Despite numerous requests to your staff, we have not received or been allowed to review any of the information produced in the very limited vehicle activity surveys performed by State Parks in July. Nonetheless, based on APCD staff field observations and the placement of toilets in the SVRA, the central section of the Le Grande tract is clearly an area of high vehicle activity. Most of the camping occurs here, and the offroad vehicles associated with the campers ride out from, into and around this area all day long.

   Appropriately designed vehicle activity surveys need to be performed to identify the highest vehicle activity areas in the SVRA, and must include the area where the camping is concentrated. The mobile monitoring proposed by Dr. Cowherd could significantly aid this effort.

4. There is no plan for determining where potential emission hot spots might be located. The DPMRP says that Pi-swirl and other measurements will be performed but does not contain specific protocols for how and where the sampling will occur. For example: how many samples will be collected and where? What criteria will be used to determine the representativeness of each sample for a given area of the SVRA? How will the data will be used to help define and site control measures?

   Again, Dr. Cowherd's recommendation to perform low cost, mobile monitoring would be very helpful in helping define where the Pi-Swerl sampling would be most effective, but State Parks staff was not receptive to this idea. Instead, they suggested a significant (but unspecified) increase in the planned use of the Pi-Swerl to cover a larger (but unspecified) area of the dunes; this would clearly add substantially to the cost of your monitoring proposal with no justification of where and why the additional analyses would be performed. Considerable additional information is needed on how and where the Pi-Swerl analyses would be performed, how the data would be used to determine appropriate placement of control measures, and what the cost of this analysis would be.

5. We have repeatedly questioned the value and location of the Met One particle counters proposed for use. The data these samplers are designed to collect is not directly applicable to any of the goals of the DPMRP related to determining appropriate permanent sites for monitoring and control measure implementation. Instead, State Parks seems intent on trying to measure salt content in the ambient air. The APCD has collected and speciated a considerable amount of PM data in this area. Our studies clearly show that sea salt will overwhelm any near shore particulate samplers on calm days; however, salt content on high wind episode days tends to average about 10%. Our studies also show that salt content diminishes rapidly as you move inland. Further study of this by State Parks will contribute nothing to determining where controls or permanent monitors should be sited and will only serve to confuse interpretation of the other data collected; this proposal should be eliminated from the monitoring plan.

In summary, the plan as written does not comply with the requirements of Rule 1001 and does not provide the level of information identified by the Coastal Commission to qualify for a master permit application. We are very concerned that State Parks will consume their entire budget for this effort on unwarranted data gathering that will be of limited use and not produce any actual emission reductions.

Given the nature of the changes we've recommended, State Parks must make substantive changes to the PMRP to meet the specific requirements and milestone compliance dates in Rule 1001. That does not appear likely at this point in time.

Please give me a call me to discuss where to go from here.

Sincerely,

Larry R. Allen
Air Pollution Control Officer

LRA/ksj

Attachments:
Comments from MRI Global, dated September 24, 2012

Control of Emissions from Oceano Dunes State Vehicle Recreational Area

Dr. Chatten Cowherd
Midwest Research Institute

Background

This paper references the revised version of the PMRP (September 7, 2012) and focuses on the proposed monitoring program directed to determining (a) the sand sheet areas within the SVRA that contribute most to problematic PM10 emissions, (b) the role of dune vehicle activity in contributing to PM10 emissivity of the sand sheets, and (c) locations best suited for cost-effective deployment of measures for controlling sand flux as the driver for wind generated dust emissions. Note that the control of emissions from vehicle track-out is tied to control of emissions from sand sheets.

Approach

This problem should be approached from the understanding of (a) the dust emission process and (b) the function of technically and economically feasible dust controls that are suitable for this application. It is likely that the reservoir of PM10 within the sand sheet surface is affected by a variety of processes both direct and indirect, including (a) soil disturbance and abrasive compression grinding by recreational vehicle activity, (b) loss of near-shore foredune structures in key areas due to vehicle activity, and (c) the windborne movement, transport and deposition of particles from one area to another. Although the direct contribution of surface disturbance and abrasion is not fully understood in this dune environment, these phenomena are well recognized as mechanisms for generating new fine particles and sustaining the emission process on unpaved travel surfaces in a variety of other settings. In the case of the subject sand sheets, it is likely that much of the fine particle reservoir lies on or just below the surface, making it vulnerable to entrainment as salting sand is transported across the surface by high winds.

Because saltation is the driving force for generation of fine particle emissions during high wind events, the approach to dust control is directed to capturing saltating sand near the points of release. As stated in the PMRP, the most promising controls are vegetation, artificial roughness elements, and wind fencing. Projected efficiencies for these methods are reported in the PMRP, based on field studies in areas similar to the SVRA. The PMRP notes that since it is not possible to measure the effectiveness of these controls from localized PM10 concentration, saltation (sand flux) can be used as a surrogate for PM10 emissions. Accordingly, Cox Sand Catchers (CSCs) were used for control performance evaluation.

Vehicle Activity Setting

As a foundation for the proposed monitoring study, it is important to map the vehicle activity across the emissive sand sheet areas, because it is likely that areas of high vehicle activity will produce the greatest emissions. With that information in hand, options for locating saltation controls immediately downwind of the hotspot areas can be considered early in the design and execution of the monitoring program. Ultimately, dust controls should be strategically placed to capture and stabilize saltating sand in adjacent areas that are protected from vehicle activity.

Selection of Dust Controls

As stated above, the PMRP identifies the most promising controls as vegetation, artificial roughness elements, and wind fencing. Projected efficiencies for these methods are reported in the PMRP, based on field studies performed in the SVRA where CSCs were used for control performance evaluation. The only artificial roughness elements tested were straw bales placed in a staggered pattern, but a concern was noted regarding the durability of this measure.

Berms of woodchip mulch constitute another type of artificial roughness element that has been shown to be very effective in capturing saltating sand in the Antelope Valley and other nearby desert environments in California. These berms have proven very durable in high wind environments (gusts exceeding 70 mph) and have a large capacity for collecting saltating sand.

Part of the process of selecting controls relates to the feasibility to install such controls in traffic-protected areas adjacent to dune vehicle activity. Making this determination requires a detailed analysis of dune vehicle activity patterns, so the controls can be strategically placed for maximum cost effectiveness.

Another aspect of long-term control effectiveness relates to the periodic restoration steps that must be taken to maintain sand transport controls. It is necessary to remove or stabilize captured sand which otherwise would bury the control. This aspect is discussed in the PMRP, with regard to the fencing that borders access roadways for the purpose of controlling track-out emissions. With regard to woodchip mulch berms, it should be noted that restoration can be accomplished by rolling the berm upwind onto the collected sand deposit, which raises the profile and increases the sand capture capacity significantly.

Monitoring Program

One clear goal of the monitoring program is to compare the air quality impact of dune vehicle activity in the SVRA against the baseline air quality that is found with no activity. The concept of transect analysis that follows the prevailing direction of high winds (300 deg) from the shoreline to the eastern boundary of the SVRA may be useful for evaluating the effect of vehicle activity on air quality. In the PMRP, four transects are proposed, two crossing areas subject to vehicle activity and the other two crossing areas not subject to vehicle activity. Obviously, it is important that the selected transects are representative of the active and the control areas of the SVRA, which may be a challenge because of localized differences in vehicle activity, dune structure and other topographical effects that influence the air flow during high winds.

Just as important, the monitoring program should (a) identify the source areas causing the highest ambient PM10 levels on the Nipomo Mesa and (b) focus on the emission hot spots within those areas corresponding to high vehicle activity coupled with exposure to high wind shear at the surface. This will provide critical information in identifying the likely places for locating sand transport controls downwind of areas with high emissions and in areas protected from vehicle activity. It is also important to quantify the sand flux rates that must be accommodated by the dust controls so that the frequency of control restoration can be projected

Proposed Monitoring Methods

The monitoring methods proposed for the field study are summarized below. In each case, it is important that the use of the data thus generated be clearly stated so that the value of the method can be ascertained.

- **Meteorological Monitoring** –Although meteorological monitoring at selected locations is essential, there seems little to be gained by tracking wind speed and direction, temperature and relative humidity along the length of each transect, unless it can be shown specifically how this information will be used. In addition, the derivation of shear stress (and sand flux) at the base of certain towers with wind speed sensors at multiple heights does not seem necessary, if CSCs are used to measure the sand flux directly (see below). It seems more important to understand the influence of topographical and groundcover effects, including dune structure, on localized wind flow patterns so that areas of high wind exposure can be identified. This will allow projection mapping of such areas within the SVRA.
- **PI-SWERLS**--The use of PI-SWERLS for point measurements of surface emissivity might be cost-effective if it can be shown that large areas of the SVRA have similar PI-SWERL signatures, so that the applicable area of a measurement is much larger than the footprint of the instrument. According to DRI, prior testing with PI-SWERLS indicated a relatively consistent soil characterization in a limited test area within the SVRA, but not subject to significant riding activity. In addition, some field performance problems with the PI-SWERL were as noted in the PMRP.
- **Aerosol Particle Counts**--It is unclear as to the value of particle number counts in size ranges below 10 microns in this analysis, so it is important to describe specifically how this information will be used. Another issue is the challenge in establishing the representativeness of fixed point monitoring sites for particle counts; this could be mitigated through mobile monitoring, as discussed below.
- **Mass PM10 Concentrations**—In the PMRP, it is proposed that EBAM samplers be used to measure PM10 concentrations along transects identified above. However, in areas

subject to vehicle activity, the PM10 concentration at the specified sampling height of 2m to 4m is likely to represent localized emissions rather than the cumulative effect of emissions on the air transport stream that passes well above terrain features to ambient air stations downwind. These problems would not apply to the proposed air quality tracking in flat areas with open fetch at the eastern ends of transects. However, the proposed concentration monitoring at fixed locations in the riding areas could still provide reference point comparisons for the mobile monitoring described below. In addition the EBAM samplers, if appropriately located, could be used to intercept the plumes from emission hotspots likely corresponding to areas of high vehicle activity coupled with high wind exposure.

- **Cox Sand Catchers--**The cumulative sand flux at any point along the transect over the duration of a high wind event can be measured directly by Cox Sand Catchers (CSCs), which are low-cost passive devices with no electronic components subject to failure in a high-challenge environment. Typically the sand flux builds to a relatively stable value along a path within an open area free of obstacles to wind flow (fetch effect). Locating CSCs downwind of hotspot areas would provide critical data on the sand flux challenges that would have to be met in designing control measures for capturing saltating sand.

Mobile Monitoring

As mentioned in our September 12, 2012 conference call, I recommend that mobile monitoring be used as a low-cost means for mapping the areas traveled by recreational vehicles. A representative recreational vehicle can be readily converted to a mobile monitor by equipping it with a continuous PM10 monitor (such as a DustTRAK), a GPS module, and a data logger. Mobile monitoring could be configured to generate useful data in two modes, as described below. In both cases, the monitoring vehicle would drive at a fairly constant speed (say, 25 mph) along routes normally traveled by recreational vehicles, but selectively paralleling the beach shoreline. Also in both cases, the mobile monitoring measurements are evaluated on a relative rather than an absolute basis, so the requirement for measurement accuracy is less stringent than when determining compliance with an air quality standard.

Mobile monitoring can be used to map plume concentration, especially in areas with high vehicle activity. For this application, the intake to the sampling system would be located above the center of the vehicle so that the dust plume from the vehicle does not impact the sample stream. This type of mapping would be very useful in identifying PM10 emission hotspot areas that could be correlated with vehicle activity and with surface exposure to high winds. This monitoring would be performed during periods of high winds.

Mobile monitoring can also be used to map fine particle emissivity, also with emphasis on areas with high vehicle activity. In this case the monitoring system intake would be located on the side of the vehicle so that the system captures the dust plume generated by the contact area between a tire and the sand surface beneath. This monitoring would be performed during periods of light winds. The suitability of the method is based on a likely relationship between the dust generated from the sand sheet by vehicle travel and the dust generated by the wind erosion process. This relationship could be verified by adjunct monitoring with the PI-SWERL to obtain an independent measure of the fine particle emissivity, assuming that PI-SWERL results are relatively consistent with PM10 concentration measurements from mobile monitoring along specified travel routes.

Mobile monitoring would be used to tie results from fixed point monitors with the mapped plume and emissivity characteristics of sand sheets along the test routes taken in riding and non-riding areas of the SVRA. In turn, this would help in establishing the representativeness of fixed point monitoring locations. This would also assist in identifying appropriate locations for deploying control measures for capturing and stabilizing saltating sand.

Recommendation

It is recommended that the mobile monitoring measurement approach be tested immediately to verify the procedure for generating, processing and mapping field results in both the plume concentration (windy) mode and the fine particle emissivity (light wind) mode of operation. A DustTRAK would be suitable as a continuous PM10 monitor for this application, In addition it is recommended that the test vehicle be equipped with a video camera to provide further documentation of field conditions under which testing was performed.

This early testing would provide critical information on the variations of localized plume density and surface emissivity across the SVRA, including areas that would have just recently been opened to seasonal riding activity. This information would also be very valuable in establishing how mobile monitoring data can be used to identify representative sites for fixed point monitoring, including those deployed for transect analysis. The “shake-down” mobile monitoring could be followed by selected fixed point monitoring, to make sure that all appropriate monitoring and data processing methods are field tested prior to the main study under much more active wind conditions of the springtime when the most essential data will be collected.

Summary

Most control measures for sand transport (and resulting PM10 emissions) are designed to capture saltating sand, thereby reducing the sand flux from the upwind to the downwind side of the control. This is the case for rows of vegetation and for wind fences already used at the SVRA. Also it should be noted that woodchip mulch berms have proven very effective as sand flux controls in similar high-wind desert environments in the Antelope Valley and adjacent areas. Dust controls should be sited preferentially downwind of emission hotspots, in areas protected from vehicle activity and amenable to periodic restoration steps that must be taken to maintain and sustain sand transport controls.

The monitoring program has a number of important purposes, one being to help determine appropriate locations for permanent comparison monitoring sites downwind of the riding and non-riding areas. Also of critical importance is the need for the program to help identify (a) the upwind source areas causing the highest PM10 levels on the Nipomo Mesa, (b) appropriate control measure deployment sites within these upwind source areas, and (c) the sand flux rates for which the controls must be designed to accommodate.

Success in accomplishing the latter goal would be considerably enhanced by conducting mobile monitoring to identify emission hotspots that couple high wind exposure with a substantial reservoir of fine particles in the surface sand. It is likely that vehicle activity has a significant role in intensifying fine particle reservoirs through surface disturbance and grinding processes that generate fine particles on and just below the sand sheet surface in areas impacted by the vehicles. Mobile monitoring can also provide valuable assistance in evaluating the representativeness of fixed and permanent monitoring sites for transect analysis or for other uses.

It is recommended that the mobile monitoring method be tested as soon as arrangements can be made, so that its value in making critical maps of localized PM10 plume concentration (windy conditions) and sand sheet PM10 emissivity (light wind conditions) can be explored and optimized. Moreover, this would provide an opportunity to demonstrate how mobile monitoring can be used to determined appropriate locations for permanent monitoring sites downwind of riding and non-riding areas. The “shake-down” monitoring program would make sure that all monitoring and data processing methods are established prior to the main testing under much more active wind conditions of the springtime, when the most essential data will be collected.